PROJECT NUMBER : 2707
PROJECT TITLE : Vision Inspection Technologies
PROJECT LEADER : R. J. Maher
PERIOD COVERED : February, 1991

I. PACK INSPECTION SYSTEM

A. **Objective:** Develop and implement an on-line cigarette pack inspection system with the capability for global inspection.

B. **Results:** Tuning and testing of the OSIRIS prototype which was installed at Stockton Street in mid-January has continued in preparation for a formal evaluation of the system's performance. The system has demonstrated its unique capability for detecting random defects such as crushed packs and printing errors. Adjustments to the vacuum conveyor to minimize pack wobble during image acquisition have reduced the nuisance reject rate to acceptable levels. A QA audit of rejected packs was carried out over a two-week period to estimate the nuisance reject rate. The rate was found to be 40% of the total reject rate during the first week and only 20% the second week. Two hardware problems remain to be resolved. The first is attributed to an error in the Matrox microcode which results in periodic system hangs. A corrected release of the Matrox software may eliminate this problem. The second hardware problem effects the performance of one of the three cameras. Efforts to address this problem are continuing.

The OSIRIS technology has been transferred to Itran in order to permit the development of a commercial Itran/OSIRIS inspection system based on Itran's new FS-11 image processing board.

C. **Plans:** Continue efforts to eliminate hardware malfunctions. Install and test the low variance enhancement to the inspection algorithm. Initiate the formal evaluation of the system's performance.

II. PRINT WEB INSPECTION

A. **Objective:** Develop a system for the global inspection of print web on the printing press.

B. **Results:** The Guay/Dalsa camera data rate was increased to 20 MHz and a synchronizer circuit added to the camera/Trapix interface. The laboratory prototype web inspection system can now capture high resolution images from a surface moving at 400 ft/min. Substitution of a 512 element camera for our current 1024 element camera will permit operating at the target surface speed of 800 ft/min. A previously reported line interference pattern has been eliminated and the image contrast improved. An effort to quantify the variation in the image gray scale values has been initiated.

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C. **Plans:** Increase the surface speed capability to 800 ft/min. Complete the experiments on the gray scale variation. Test and refine the proposed inspection algorithms.

III. OFF-LINE INSPECTION

A. **Objective:** Develop a system for the off-line inspection of print cylinder verification prints.

B. **Results:** A detailed plan for the development of an inspection system has been prepared. The plan includes recommendations for both hardware and inspection algorithms along with a development schedule and cost estimates. The plan was presented to a group of personnel from Engineering Applied Technology, Development Engineering and the Vision Technologies Project. The plan was modified in accordance with several recommendations from the group.

An algorithm to align images relative to a master was developed and implemented using the Matrox 1280 imaging system.

C. **Plans:** Review the plan with personnel from Colonial Heights Packaging. Prepare and submit appropriation requests.

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